



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

## NOTICE OF ALLOWANCE AND FEE(S) DUE

7590

03/19/2009

James C. Scheller  
BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN LLP  
Seventh Floor  
12400 Wilshire Boulevard  
Los Angeles, CA 90025-1026

EXAMINER

LI, AIMEE J

ART UNIT

PAPER NUMBER

2183

DATE MAILED: 03/19/2009

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/038,431	12/31/2001	Sushma Shrikant Trivedi	04860.P2687	7868

TITLE OF INVENTION: METHOD AND APPARATUS FOR COMPUTING VECTOR ABSOLUTE DIFFERENCES

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1510	\$0	\$0	\$1510	06/19/2009

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

### HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

**IMPORTANT REMINDER:** Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

# **PART B - FEE(S) TRANSMITTAL**

**Complete and send this form, together with applicable fee(s), to:** Mail **Mail Stop ISSUE FEE**  
**Commissioner for Patents**  
**P.O. Box 1450**  
**Alexandria, Virginia 22313-1450**  
**or Fax (571)-273-2885**

**INSTRUCTIONS:** This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

7590

03/19/2009

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

## **Certificate of Mailing or Transmission**

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

James C. Scheller

BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN LLP  
 Seventh Floor  
 12400 Wilshire Boulevard  
 Los Angeles, CA 90025-1026

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/038,431

12/31/2001

Sushma Shrikant Trivedi

04860.P2687

7868

TITLE OF INVENTION: METHOD AND APPARATUS FOR COMPUTING VECTOR ABSOLUTE DIFFERENCES

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
-------------	--------------	---------------	---------------------	----------------------	------------------	----------

nonprovisional

NO

\$1510

\$0

\$0

\$1510

06/19/2009

EXAMINER	ART UNIT	CLASS-SUBCLASS
----------	----------	----------------

LI, AIMEE J

2183

712-222000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. Use of a Customer Number is required.

2. For printing on the patent front page, list

(1) the names of up to 3 registered patent attorneys or agents OR, alternatively,

1

(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

2

3

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

☐ Issue Fee

☐ Publication Fee (No small entity discount permitted)

☐ Advance Order - # of Copies

4b. Payment of Fee(s): (Please first reapply any previously paid issue fee shown above)

☐ A check is enclosed.

☐ Payment by credit card. Form PTO-2038 is attached.

☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number (enclose an extra copy of this form).

5. Change in Entity Status (from status indicated above)

☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27.

☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature

Date

Typed or printed name

Registration No.

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
[www.uspto.gov](http://www.uspto.gov)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/038,431	12/31/2001	Sushma Shrikant Trivedi	04860.P2687	7868

7590 03/19/2009

James C. Scheller  
BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN LLP  
Seventh Floor  
12400 Wilshire Boulevard  
Los Angeles, CA 90025-1026

EXAMINER

LI, AIMEE J

ART UNIT

PAPER NUMBER

2183

DATE MAILED: 03/19/2009

## Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)

(application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 453 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 453 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

### Notice of Allowability

Application No.

10/038,431

Examiner

AIMEE J. LI

Applicant(s)

TRIVEDI ET AL.

Art Unit

2183

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to Amendment filed 13 February 2009.
2. ☒ The allowed claim(s) is/are 1-4, 7, 9-15, 18, 20-29, 32, 35-41 renumbered as 1-31.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some\* c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
- \* Certified copies not received: \_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.  
**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_.
- b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

#### Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date \_\_\_\_
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date \_\_\_\_
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_.

/Aimee J Li/  
Primary Examiner, Art Unit 2183

### EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.
2. Authorization for this examiner's amendment was given in a telephone interview with Tatianna Rossini (Reg. No. 56,833) on 10 March 2009.
3. Amendments to the claims are highlighted and show added language with underlining and deletions with double brackets or strikethroughs. The application has been amended as follows:

Claim 1: *(Currently Amended)* A method for execution by a microprocessor in response to receiving a single instruction, the method comprising:

receiving a first vector of numbers from a first entry in a register file and a second vector of numbers from a second entry in the register file;

selecting a first plurality of numbers of the first vector from a string- of bits in the first entry and a second plurality of numbers of the second vector from the second entry according to a configuration specified by the single instruction that indicates ~~a way~~ how to partition the string of bits in the first entry into the first plurality of numbers; and

generating simultaneously a third plurality of numbers, each of which is an absolute difference between a number in the first plurality of numbers and a number in the second plurality of numbers;

wherein the third plurality of numbers are saved in a third entry in the register file;

wherein the above operations are performed in response to the microprocessor receiving the single instruction, wherein the single instruction indicates the first entry for the first plurality of numbers, the second entry for the second plurality of numbers, and the third entry for the third plurality of numbers in the register file.

Claim 3: *(Currently Amended)* A method as in claim 2 wherein the first intermediate number and the second intermediate number are produced in parallel; and wherein the third plurality of numbers are generated ~~substantially~~ simultaneously.

Claim 9: *(Currently Amended)* A method as in claim 1 wherein the single instruction specifies an index of ~~[[the]]an~~ entry in the register file.

Claim 12: *(Currently Amended)* A machine readable media containing an executable computer program instruction which when executed by a digital processing system causes said system to perform a method comprising:

receiving a first vector of numbers from a first entry in a register file and a second vector of numbers from a second entry in the register file;

selecting a first plurality of numbers of the first vector from a string of bits in the first entry and a second plurality of numbers of the second vector from the second entry according to a configuration specified by the instruction that indicates ~~a way~~ how to partition the string of bits in the first entry into the first plurality of numbers; and

generating simultaneously a third plurality of numbers, each of which is an absolute difference between a number in the first plurality of numbers and a number in the second plurality of numbers;  
wherein the third plurality of numbers are saved in a third entry in the register file;  
wherein the above operations are performed in response to a microprocessor of the digital processing system receiving the instruction, wherein the instruction indicates the first entry for the first plurality of numbers, the second entry for the second plurality of numbers, and the third entry for the third plurality of numbers in the register file.

Claim 15: *(Currently Amended)* A media as in claim ~~[[12]]~~13 wherein the method further comprises:

testing if an overflow occurs in producing the first intermediate number and the second intermediate number;  
saturating the absolute difference between the first number and the second number if an overflow occurs.

Claim 20: *(Currently Amended)* A media as in claim 12 wherein the single instruction specifies an index of ~~[[the]]~~an entry in the register file.

Claim 23: *(Currently Amended)* An execution unit in a microprocessor, the execution unit comprising:

a first circuit configured to receive a first vector of numbers from a first entry in a register file;

a second circuit configured to receive a second vector of numbers from a second entry in the register file;

a selector circuit configured to select a first plurality of numbers of the first vector from a string- of bits in the first entry and a second plurality of numbers of the second vector from the second entry according to a configuration specified by the single instruction that indicates ~~a way~~ how to partition the string- of bits in the first entry into the first plurality of numbers; and

a third circuit coupled to the first circuit and the second circuit, the third circuit, in response to the microprocessor receiving the single instruction, generating simultaneously a third plurality of numbers, each of which is an absolute difference between a number in the first plurality of numbers and a number in the second plurality of numbers, wherein the single instruction indicates the first entry for the first plurality of numbers, the second entry for the second plurality of numbers, and the third entry for the third plurality of numbers in the register file, wherein the microprocessor is a media processor disposed on an integrated circuit with a memory controller.

Claim 25: (*Cirrently Amended*) A processing system, comprising:

an execution unit comprising

a first circuit configured to receive a first vector of numbers from a first entry in a register file;

a second circuit configured to receive a second vector of numbers from a second entry in the register file;



a selector circuit configured to select a first plurality of numbers of the first vector from a string of bits in the first entry and a second plurality of numbers of the second vector from the second entry according to a configuration specified by ~~[[the]]~~a single instruction that indicates ~~a way~~ how to partition the string- of bits in the first entry into the first plurality of numbers;

a third circuit coupled to the first circuit and the second circuit, the third circuit, in response to the microprocessor receiving the single instruction, generating simultaneously a third plurality of numbers, each of which is an absolute difference between a number in the first plurality of numbers and a number in the second plurality of numbers, wherein the single instruction indicates the first entry for the first plurality of numbers, the second entry for the second plurality of numbers, and the third entry for the third plurality of numbers in the register file, wherein the microprocessor is a media processor disposed on an integrated circuit with a memory controller.

Claim 26: *(Currently Amended)* An execution unit in a microprocessor, the execution unit comprising:

means for receiving a first vector of numbers from a first entry in a register file and a second vector of numbers from a second entry in the register file;

means for selecting a first plurality of numbers of the first vector from a string- of bits -in the first entry and a second plurality of numbers of the second vector from the second entry according- to a configuration specified by ~~[[the]]~~a single

instruction that indicates ~~a way~~ how to partition the string- of bits in the first entry into the first plurality of numbers; and  
means for generating simultaneously a third plurality of numbers, each of which is an absolute difference between a number in the first plurality of numbers and a number in the second plurality of numbers; wherein the third plurality of numbers are saved in a third entry in the register file;  
wherein the above means perform operations in response to the microprocessor receiving ~~[[a]]the~~ single instruction, wherein the single instruction indicates the first entry for the first plurality of numbers, the second entry for the second plurality of numbers, and the third entry for the third plurality of numbers in the register file.

Claim 41: *(Currently Amended)* An execution unit as in claim 40, wherein the memory controller is usable by a host central processing unit (CPU) not disposed on the integrated circuit to access ~~[[the]]~~ memory.

#### **Reasons for Allowance**

4. The following is an examiner's statement of reasons for allowance:
5. The prior art searched and found have not taught the combination of the limitations in the claim. The prior art searched and found have taught a single instruction finding an absolute difference between two vectors, but not taught, in combination with other limitations in the claim, a single instruction finding an absolute difference between two vectors, selects a plurality of numbers from a string of bits in a vector entry in a register file according to the instruction, and partitions the bits in the vector entry according to the instruction.

6. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to AIMEE J. LI whose telephone number is (571)272-4169. The examiner can normally be reached on M-T 7:00am-4:30pm.

8. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Chan can be reached on (571) 272-4162. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

9. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Aimee J Li/  
Primary Examiner, Art Unit 2183  
14 March 2009